

# PfaffModule7L10a

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## SUMMARY KEYWORDS

riemann sums, approximate, equal, function, recall, graph, lecture, velocity, distance, setup, typical, rate, hope, daily lives, axis, area, situation, values, setting

## SPEAKERS

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Welcome, in this lecture, I'd like to give, have a general application of approximating the area under a curve. And then I will kind of take this with very specific data in the next lecture, okay. So, we can kind of recall this kind of setup where we have, so recall that we have, right, so Riemann Sums approximating a rate function right, like approximate the area under a rate function is going to lead us to a value function.

Right, and we can have kind of an example set up, which is so here's an example set up. Which will be, so suppose that we have, so suppose that we have that  $V$  of  $T$  is going to equal the velocity at time  $T$ . And we also know that  $V$  of  $T$  is always greater than or equal to zero. So,  $V$  of  $T$  is greater than or equal to zero, I'll still leave this orange, whenever  $A$  is less than or equal to  $T$  is less than or equal to  $B$ , i.e. in that interval, okay? Then, so what happens in this setting is then, so in that situation, then we're going to have that if I have, so now let's kind of let's graph this. So I'm going to have I have my, my  $T$  axis with my values  $A$  and  $B$ . And then above that, I have my graph. So I have  $Y$ , this is  $Y$  equals  $V$  of  $T$ , right? And then if I'm looking at this area, so then this area.

Right, so this area like this is the distance traveled, right from this time, so this is like  $T$  equals  $A$  and  $T$  equals  $B$ . So from time  $T$  equals  $A$  to time  $T$  equals  $B$ . Okay, so this is just this kind of setup, if we're moving from, we're moving from having a rate function to a value function. And this process is actually what Riemann sums are going to approximate. So we could look for example, a very typical example of a rate function that we deal with in our daily lives is velocity. So we're going to be able to look at how we can use we can approximate this process of going from a rate function to a value function like distance, using the same ideas that show up in Riemann Sums. Okay, so, I hope that made some sense, and I will see you in the next lecture where we actually look at this for a specific set of data. Okay, see you then.